PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

B & L SITE
CAMPSTOOL ROAD
CHEYENNE, WYOMING

TERRACON PROJECT NO. 24055066
October 17, 2005

Prepared for:

AVI, P.C.
2035 Westland Road
Cheyenne, Wyoming 82001

Prepared by:

Terracon
1505 Old Happy Jack Road
Cheyenne, Wyoming 82001
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Terracon

Exhibit ML-7

October 17, 2005

Terracon
Consulting Engineers & Scientists

Terracon Consultants, Inc
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AVI, P.C.
2035 Westland Road
Cheyenne, Wyoming 82001

Attn: Mr. Tom Kent

Re: Preliminary Geotechnical Engineering Report
B & L Site
Campstool Road, Cheyenne, Wyoming
Terracon Project No. 24055066

Terracon has completed our preliminary geotechnical engineering study for the proposed B & L Site to be located near Campstool Road in Cheyenne, Wyoming. Authorization to proceed with this soil study was given by AVI, P.C. in a signed Agreement for Services dated September 22, 2005. This study was performed in general accordance with our proposal and agreement, Proposal No. 2405G082 dated September 22, 2005.

The results of our preliminary engineering study, including the boring location diagram, laboratory test results, test boring records, and the preliminary geotechnical recommendations needed to aid in the design and construction of foundations and other earth connected phases of this project are attached.

We appreciate being of service to you in the geotechnical engineering phase of this project, and are prepared to assist you during the construction phases as well. If you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us.

Sincerely,
TERRACON

Michael H. Frawley, E.I.T.
Staff Engineer

Brent F. Wilkins, P.E.
Geotechnical Department Manager

Reviewed by: Rick Chestnut, P.E.

mhf/bfw

Copies to: Addressee (3)

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CAMPSTOOL ROAD
CHEYENNE, WYOMING

TERRACON PROJECT NO. 24055066
OCTOBER 17, 2005

INTRODUCTION

This report contains the results of our preliminary geotechnical engineering study for the proposed B & L Site to be located near Campstool Road in Cheyenne, Wyoming. The purpose of these services is to provide information and preliminary geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions
- foundation design and construction
- earthwork
- drainage

The preliminary recommendations contained in this report are based on the results of field and laboratory testing, engineering analyses, experience with similar soil conditions and structures, and our understanding of the proposed project.

PROPOSED CONSTRUCTION

Based on information provided by the client, approximately 100 acres of undeveloped land west of Campstool Road is proposed for light industrial and commercial development. The property is situated south of Interstate 80 and adjacent to the west side of the Dry Creek Waste Water Treatment Plant. The site is bordered to the south by an abandoned railroad bed.

The specific development plan, structural design and site grading information were not available for this proposal. Therefore, we assume that maximum grade cuts will be no more than 5 feet and the future buildings will be slab-on-grade structures.

SITE EXPLORATION

The scope of the services performed for this project included site reconnaissance by a geotechnical engineer, subsurface exploration program, laboratory testing, and engineering analyses.

Field Exploration

A total of 12 test borings were performed on September 23, 2005. The widely spaced borings were advanced to approximate depths of 19.5 to 20.5 feet at the locations shown on the Boring Location Diagram, Figure 1. The borings were advanced with a truck-mounted drilling rig, utilizing 4-inch-diameter, solid-stem augers.

The borings were located in the field by the client. Approximate ground surface elevations at the boring locations were obtained by interpolation from contours indicated on the site plan. The accuracy of boring locations and elevations should only be assumed to the level implied by the methods used to determine each.

Lithologic logs of each boring were recorded by the geotechnical engineer during the drilling operations. The logs of borings are presented in Appendix A. At selected intervals, samples of the subsurface materials were taken by means of driving split-spoon and/or California barrel samplers.

Penetration resistance measurements were obtained by driving the split-spoon or California barrel into the subsurface materials with a 140-pound hammer falling 30 inches. The penetration resistance value is a useful index in estimating the consistency, relative density, or hardness of the materials encountered.

Groundwater conditions were observed in each boring at the time of site exploration and three days after the completion of drilling.

Laboratory Testing

The soil samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer. At that time, the field descriptions were reviewed and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

Laboratory tests were conducted on selected soil samples. The results of these tests are presented in Appendix B. The test results were used for the geotechnical engineering analyses, and the development of foundation and earthwork recommendations. The

laboratory tests were performed in general accordance with applicable locally accepted standards. Soil samples were classified in general accordance with the Unified Soil Classification System described in Appendix C.

Selected soil samples were tested for the following engineering properties:

- Water Content
- Plasticity Index
- Grain Size

SITE CONDITIONS

The site is located north of Crow Creek, west of the Dry Creek Waste Water Treatment Plant and south of Interstate 80 and the proposed HR Ranch Road. Further the site is situated in the southern half of Section 1, Township 13 North, Range 66 West of the 6th Principal Meridian.

At the time of the field exploration, the site was undeveloped. The ground surface was undulating native prairie and contained a moderate growth of native grasses. Site drainage was primarily to the south following natural depressions and slopes, however, portions of the northeastern part of the site drained to the north. Other site features included several stock fences that crossed the site in multiple directions.

SUBSURFACE CONDITIONS

As presented on the Logs of Boring a layer of topsoil extended to approximate depths of 4 to 9 inches. Below the topsoil layer in each boring except Borings 3008 and 3010, loose to dense, silty sand typically extended to depths of 5 feet to the maximum depth of exploration in Borings 3001, 3003 and 3006. Below the silty sand layer and below the topsoil in Borings 3008 and 3010, medium dense to dense, well- to poorly-graded sand with silt and gravel extended to depths of 5 feet to the maximum depth of exploration in Boring 3002. Below the well- to poorly-graded sand layer, medium dense to dense, silty sand or silty clayey sand extended to the maximum depth of exploration in each remaining boring. In Borings 3009 and 3010 a relatively thin layer of very stiff to hard, lean clay was interbedded within the silty sand soils.

Laboratory Test Results

Based on our experience in the Cheyenne area, the silty sand, silty clayey sand and well- to poorly-graded sand soils encountered during field exploration have a low expansive potential

At the time of the field exploration, and based on water content test results, the silty sand and well- to poorly-graded sand soils were typically in a damp to moist condition in the field.

Groundwater Conditions

Groundwater was not observed in the test borings at the time of field exploration, nor when checked 3 days after the completion of drilling. These observations represent groundwater conditions at the time of the observations only, and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors. The possibility of groundwater fluctuations should be considered when developing design and construction plans for the project.

PRELIMINARY ENGINEERING ANALYSES AND RECOMMENDATIONS

Geotechnical Considerations

Based on information from the preliminary geotechnical engineering analyses, subsurface exploration, and laboratory testing results, it is our opinion the proposed project can be developed and the commercial structures can be supported on spread footing foundation systems bearing on native soils or engineered fill. Preliminary design and construction recommendations for foundation systems and other earth related phases of the project are outlined below.

Foundation Systems

Based on our preliminary engineering analysis and experience with the local soil conditions, spread footing foundations supported on native soils may be designed using anticipated bearing capacities ranging from 2,500 to 5,000 pounds per square foot.

Exterior footings should be placed a minimum of 36 inches below finished grade for frost protection. Interior footings within heated areas of the building can be supported a minimum of 12 inches below finished grade. Finished grade is the lowest adjacent grade for perimeter footings and floor subgrade level for interior footings

The preliminary foundation recommendations contained in this report are based upon the results of limited field and laboratory testing, engineering analyses, experience with similar soil conditions and structures, and our understanding of the proposed project. The preliminary recommendations contained herein should not be used for final design of the building foundations. Additional soil borings, laboratory testing, and engineering analysis are required for the purpose of final foundation design.

Floor Slab Design and Construction

The native soils should be suitable to support floor slabs on-grade provided the upper 8 inches of the subgrade surface is scarified and recompacted in accordance with the Earthwork recommendations given herein. Compacted, engineered fill can also be used to support the floor slabs.

Some differential movement of a slab-on-grade floor system is possible if the moisture content of the subgrade soils is increased. To reduce potential slab movements, the subgrade soils should be prepared as outlined in the Earthwork section of this report.

Earthwork

The following presents generalized recommendations for site preparation, subgrade preparation, excavation, and placement of engineered fills on the project.

All earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, placement of geogrid and other geotechnical conditions exposed during the construction of the project.

Within building and pavement areas, the vegetative soils and any other deleterious materials should be removed. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

All engineered fill materials should be placed in maximum 8-inch-thick lifts and compacted to at least 98% of ASTM D698 for structures and 95% of ASTM D698 for pavements. Engineered fills should be compacted within a moisture range of 3 percent below to 3 percent above optimum unless modified by the project geotechnical engineer.

Although evidence of underground facilities was not observed during the field work, such features could be encountered during the final geotechnical study and/or construction. If unexpected or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Excavations into the silty sand and well- to poorly-graded sand soils may encounter weak zones with possible sloughing or caving conditions. It is possible that loose zones of sandy soils in certain areas will not be stable at the maximum slope inclinations as defined by the OSHA excavation and trench regulations. Slope inclinations flatter than the OSHA maximum values should be used.

Excavation penetrating the cemented sand layers will require the use of specialized heavy-duty equipment to facilitate hard soil break-up and removal. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

The soils to be penetrated by the proposed excavations may vary significantly across the site. The preliminary soil classifications are based solely on the materials encountered in widely spaced exploratory test borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

GENERAL COMMENTS

The preliminary analysis and recommendations presented in this report are based on the data obtained from the borings performed at the indicated locations. This report does not reflect variations in the subsurface conditions which may occur between borings or across the site. The nature and extent of such variations may not become evident until the final geotechnical study or construction. If variations appear at subsequent times, it will be necessary to reevaluate the recommendations of this report.

Terracon should be retained to perform a final geotechnical engineering study on the site to verify that similar conditions exist throughout the proposed area of construction and to provide detailed design and construction recommendations. Terracon should also be retained to provide testing and observation during excavation, grading, foundation, and construction phases of the project

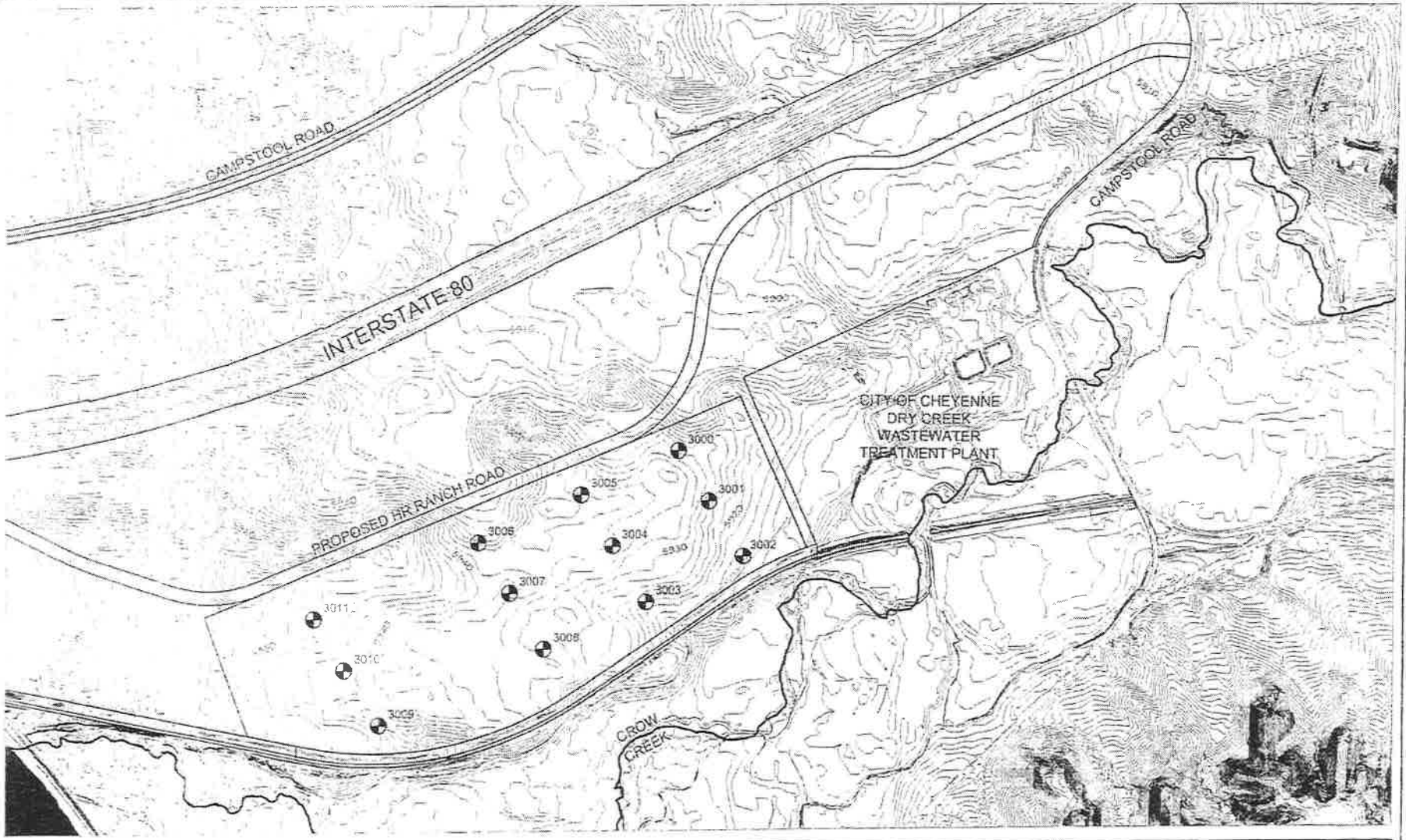
The scope of services for this project are not intended to address the final design considerations at the site and should not be used as such. Additional soil borings, laboratory testing, and engineering analysis will be required to support final geotechnical design and recommendations for the building foundations, slabs on-grade, and pavements.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In

the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A



APPROXIMATE LOCATION OF BORING.

NOTE: Site plan based on information provided by the client. Diagram is for general location only, and is not for construction purposes.

N

NTS

BORING LOCATION DIAGRAM
B & L SITE
CAMPSTOOL ROAD
CHEYENNE, WYOMING

Drawn By:	MHF	Terracon	Project No.: 24055066
Checked By:	BFW	1505 Old Happy Jack Road Cheyenne, Wyoming 82001	Date: 10/05
File Name:	BL Diagram		Figure No.: 1

Exhibit ML-7

LOG OF BORING NO. 3000

CLIENT AVI, P.C.

SITE Campstool Road, Cheyenne, Wyoming

PROJECT B & L Site

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES SULFATE, %	SAMPLES PENETRATION BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	Approx. Surface Elev.: 5929.5 ft									
	0.7 TOPSOIL, 8" 5929			1	SS		16			
	SILTY SAND, fine to medium sand, trace fine gravel, medium dense to dense, damp, light brown									
	5.5 5924		SM	2	SS		35			
	WELL-GRADED SAND, damp, light brown 5922.5	5								
	7 SILTY CLAYEY SAND, fine sand, medium dense, damp, brown		SC SM	3	SS		19			
	12 5917.5	10								
	SILTY SAND, fine sand, medium dense, damp, light brown		SM	4	SS		18			
		15								
	20.5 5909		SM	5	SS		24			
	End of Boring	20								

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	No Water WD	No Water AD	
WL			
WL	AD measured on 9/26/05		

Terracon

BORING STARTED	9-23-05		
BORING COMPLETED	9-23-05		
RIG	CME - 55	FOREMAN	MHF
		JOB #	24055066

LOG OF BORING NO. 3000

CLIENT: AVI, P.C.

SITE: Campstool Road, Cheyenne, Wyoming

PROJECT: B & L Site

Approx. Surface Elev.: 5929.5 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES SULFATE, %	SAMPLES PENETRATION BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.7 TOPSOIL, 8" 5929			1	SS		16	7.2		
	SILTY SAND, fine to medium sand, trace fine gravel, medium dense to dense, damp, light brown									
	5.5 5924	5	SM	2	SS		35			
	WELL-GRADED SAND, damp, light brown									
	7 5922.5									
	SILTY CLAYEY SAND, fine sand, medium dense, moist, brown	10	SC SM	3	SS		19	22.9		
	12 5917.5									
	SILTY SAND, fine sand, medium dense, damp, light brown	15	SM	4	SS		18			
	20.5 5909	20	SM	5	SS		24	7.1		
	End of Boring									

The stratification lines represent the approximate boundary lines between soil and rock types: In-situ, the transition may be gradual

WATER LEVEL OBSERVATIONS, ft			
WL	No Water WD	No Water AD	
WL			
WL	AD measured on 9/26/05		

Terracon

BORING STARTED	9-23-05		
BORING COMPLETED	9-23-05		
RIG	CME - 55	FOREMAN	MHF
		JOB #	24055066

LOG OF BORING NO. 3001

CLIENT: AVI, P.C.

SITE: Campstool Road, Cheyenne, Wyoming

PROJECT: B & L Site

Approx. Surface Elev.: 5926 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES SULFATE, %	SAMPLES PENETRATION BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.5 TOPSOIL, 6" 5925.5 SILTY SAND, fine to medium sand, medium dense to dense, damp, light brown			1	SS		18			
		5	SM	2	SS		31	4.1		
	Trace to little fine gravel from 7' to 12'									
		10	SM	3	CB		19			
		15	SM	4	SS		19	4.6		
		20	SM	5	SS		22			
	20.5 5905.5 End of Boring									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	No Water WD	No Water AD
WL		
WL	AD measured on 9/26/05	

Terracon

BORING STARTED	9-23-05
BORING COMPLETED	9-23-05
RIG CME - 55	FOREMAN MHF
	JOB # 24055066

Exhibit ML-7

LOG OF BORING NO. 3002

CLIENT
AVI, P.C.

SITE
Campstool Road
Cheyenne, Wyoming

PROJECT
B & L Site

Approx. Surface Elev.: 5915 ft

Depth (ft)	Description	Elev.	USCS Symbol	Sample Number	Type	Sulfate, %	Penetration Blows / ft.	Water Content, %	Dry Unit Wt pcf	Unconfined Strength, psf
0.3	TOPSOIL, 4"	5914.5		1	SS		18	2.2		
	SILTY SAND, fine to medium sand, medium dense to very dense, damp, light brown. Some fine gravel below 3'		SM	2	SS		44			
			SM	3	SS		50/8"	1.9		
12.5		5902.5								
	POORLY-GRADED SAND with SILT, fine sand, medium dense to very dense, damp, light brown		SP SM	4	SS		15			
	Layered cemented sand lenses below 17'									
19.5		5895.5	SP SM	5	SS		50/6"	5.0		
	End of Boring									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft

WL	No Water WD	No Water AD
WL		
WL	AD measured on 9/26/05	

Terracon

BORING STARTED	9-23-05
BORING COMPLETED	9-23-05
RIG CME - 55	FOREMAN MHF
	JOB # 24055066

BOREHOLE ... TERRACON.GDT 10/14/05

LOG OF BORING NO. 3003

CLIENT: AVI, P.C.

SITE: Campstool Road, Cheyenne, Wyoming

PROJECT: B & L Site

Approx. Surface Elev.: 5921 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES SULFATE, %	SAMPLES PENETRATION BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.8 TOPSOIL, 9" 5920			1	SS		15			
	SILTY SAND, fine sand, loose to dense, damp, light brown									
		5	SM	2	SS		10	4.4		
		10	SM	3	SS		8			
	Layered cemented lenses below 12.5'									
		15	SM	4	SS		50/3"	6.8		
	20.5 5900.5	20	SM	5	SS		31			
	End of Boring									

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	No Water WD	No Water AD	
WL			
WL	AD measured on 9/26/05		

Terracon

BORING STARTED	9-23-05		
BORING COMPLETED	9-23-05		
RIG	CME - 55	FOREMAN	MHF
		JOB #	24055066

LOG OF BORING NO. 3004

CLIENT: AVI, P.C.

SITE: Campstool Road, Cheyenne, Wyoming

PROJECT: B & L Site

Approx. Surface Elev.: 5936 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES SULFATE, %	SAMPLES PENETRATION BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.6 TOPSOIL, 7" 5935.5									
	SILTY SAND, fine to medium sand, medium dense, damp, light brown			1	SS		18	7.6		
	5.5 5930.5									
	WELL-GRADED SAND with SILT and GRAVEL, dense, damp, light brown	5	SM	2	SS		23			
		10	SW SM	3	SS		39	1.2		
		15	SW SM	4	SS		40			
	17.5 5918.5									
	SILTY SAND, fine sand, trace clay, medium dense, damp, brown									
	20.5 5915.5	20	SM	5	SS		26	9.9		
	End of Boring									

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft

WL	No Water WD	No Water AD
WL		
WL	AD measured on 9/26/05	

Terracon

BORING STARTED	9-23-05
BORING COMPLETED	9-23-05
RIG CME - 55	FOREMAN MHF
	JOB # 24055066

LOG OF BORING NO. 3005

CLIENT: AVI, P.C.

SITE: Campstool Road, Cheyenne, Wyoming

PROJECT: B & L Site

Approx. Surface Elev.: 5938 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: SULFATE, %	SAMPLES: PENETRATION BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf
	0.3 TOPSOIL, 4" — 5937.5 SILTY SAND, fine to medium sand, medium dense, damp, light brown			1	SS		22			
			SM	2	SS		24	6.9		
	6 — 5932 WELL-GRADED SAND with SILT and GRAVEL, medium dense, damp, pale pinkish brown	5								
	10 — 5928 SILTY SAND, fine sand, medium dense, damp, light brown			3	SS		27	1.9 5.0		
		10								
			SM	4	SS		24			
		15								
			SM	5	SS		23	5.5		
	20.5 — 5917.5 End of Boring	20								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual

WATER LEVEL OBSERVATIONS, ft

WL: No Water WD ▼ No Water AD

WL:

WL: AD measured on 9/26/05

Terracon

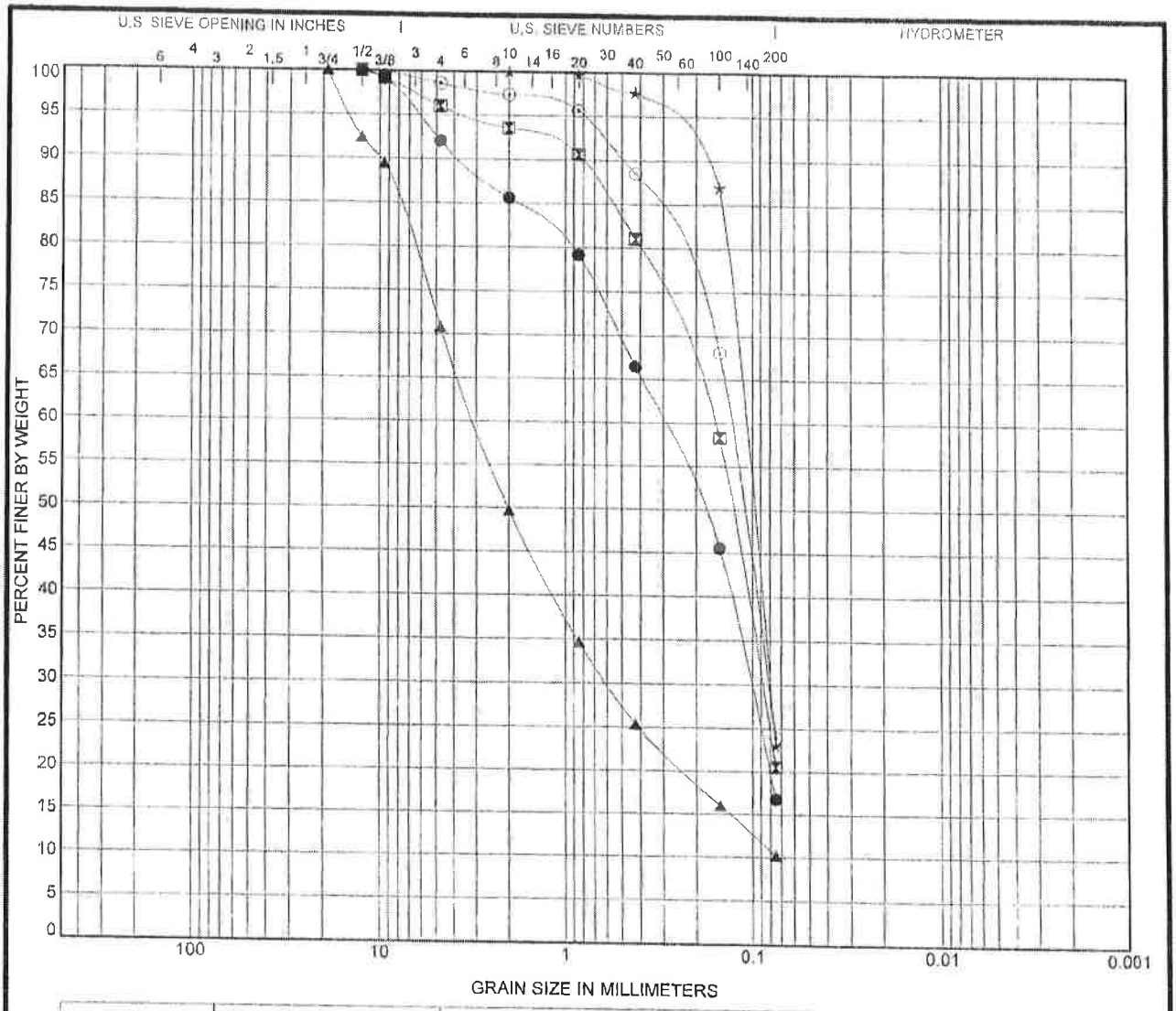
BORING STARTED: 9-23 05

BORING COMPLETED: 9-23 05

RIG: CME - 55 FOREMAN: MHF

JOB #: 24055066

APPENDIX B



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 3000	4.0ft	SILTY SAND(SM)	19	18	1		
⊠ 3002	0.3ft	SILTY SAND(SM)	NP	NP	NP		
▲ 3004	9.0ft	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.62	41.62
★ 3006	14.0ft	SILTY SAND(SM)	NP	NP	NP		
⊙ 3009	4.0ft	SILTY SAND(SM)	NP	NP	NP		

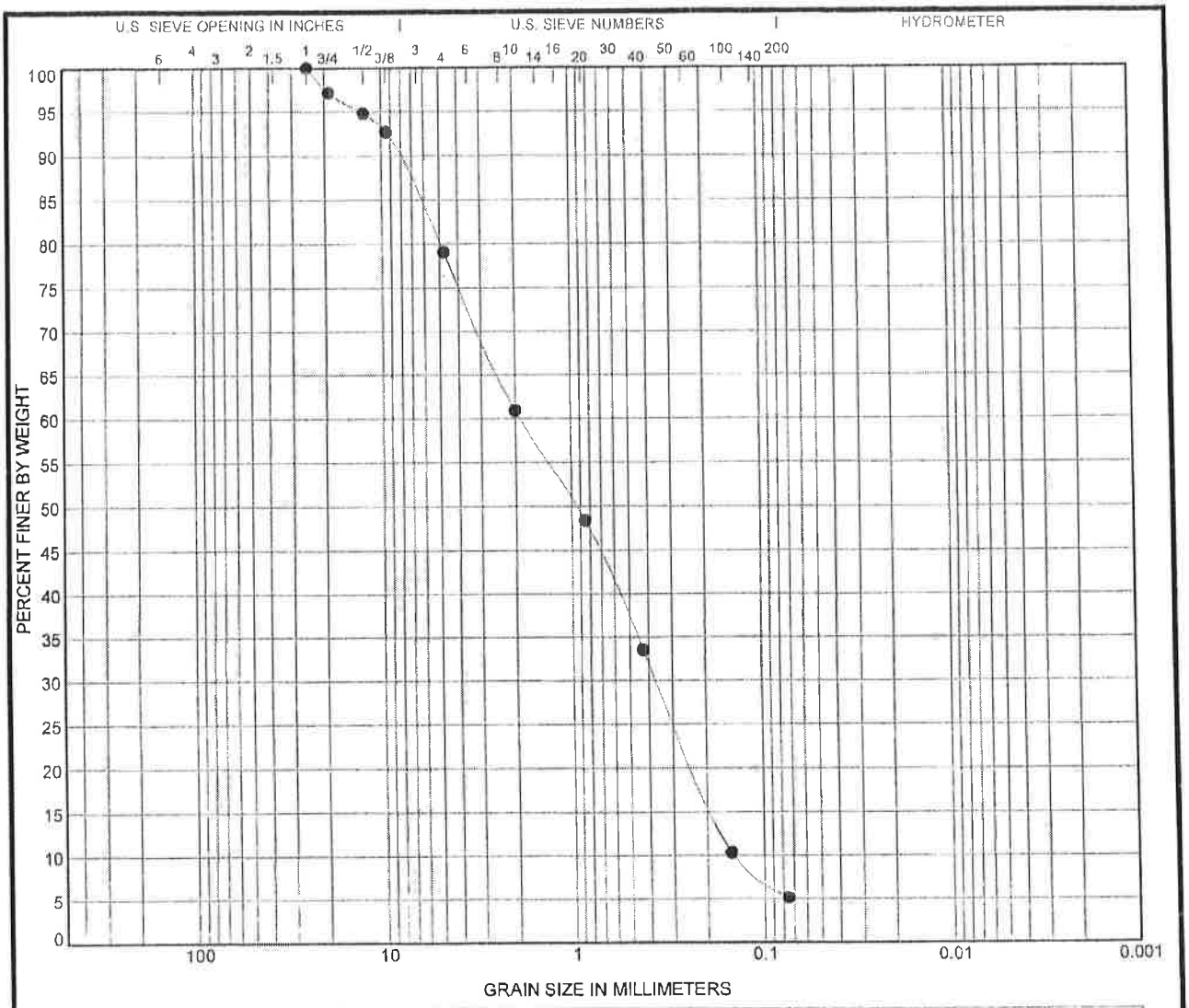
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3000	4.0ft	12.5	0.308	0.103		8.0	75.3	16.8	
⊠ 3002	0.3ft	12.5	0.162	0.089		4.0	75.5	20.5	
▲ 3004	9.0ft	19	3.047	0.601		29.1	60.6	10.2	
★ 3006	14.0ft	2	0.112	0.081		0.0	76.9	23.1	
⊙ 3009	4.0ft	9.5	0.132	0.082		1.4	74.7	24.0	

Terracon

GRAIN SIZE DISTRIBUTION

Project: B & L Site
Site: Campstool Road Cheyenne, Wyoming
Job #: 24055066
Date: 10-14-05

Exhibit ML-7



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 3010	4.0ft	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.49	13.12

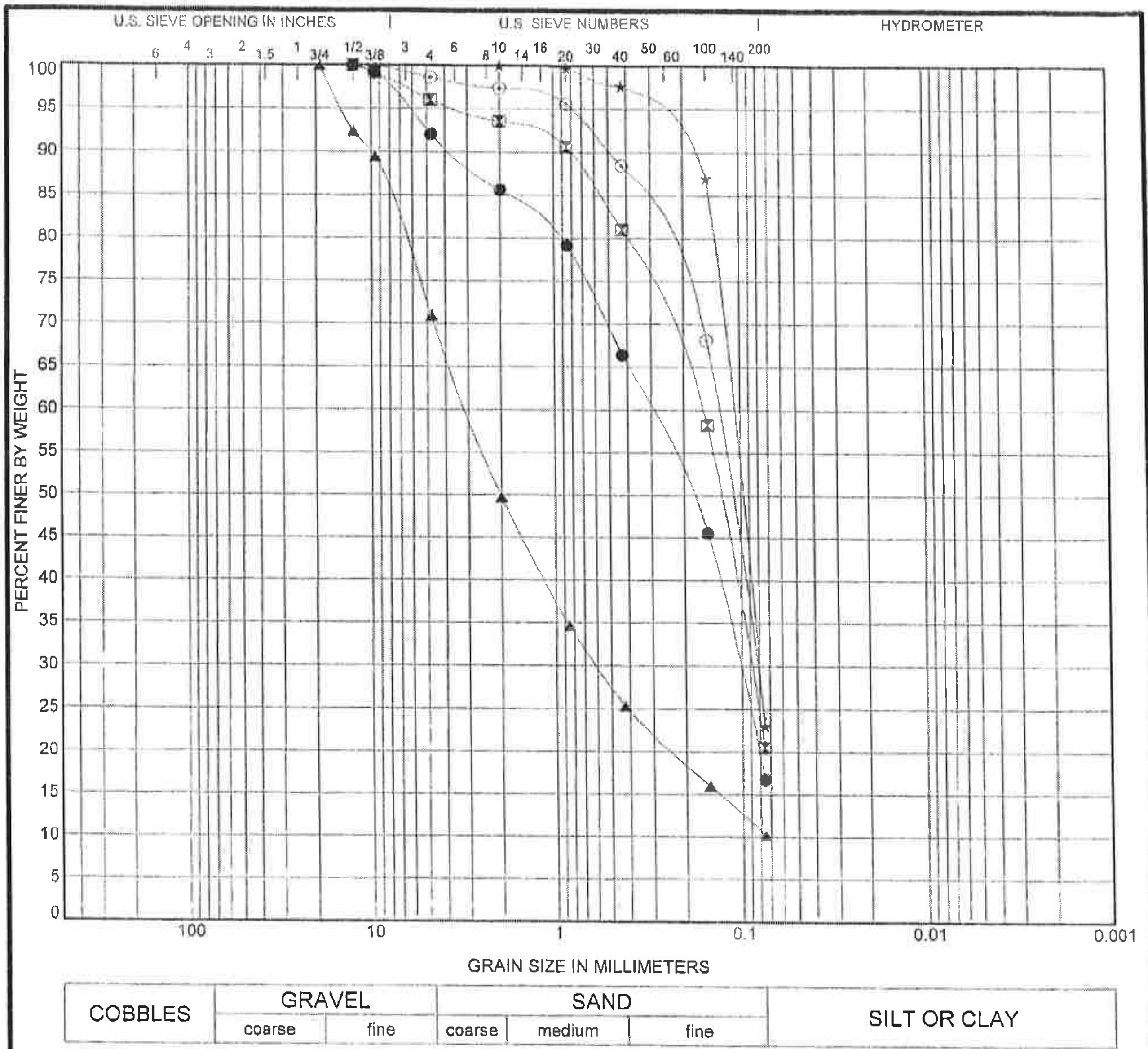
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3010	4.0ft	25	1.879	0.363	0.143	20.9	73.9	5.2	

Terracon

GRAIN SIZE DISTRIBUTION

Project: B & L Site
Site: Campstool Road Cheyenne, Wyoming
Job #: 24055066
Date: 10-14-05

Exhibit ML-7



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	3000	4.0ft	SILTY SAND(SM)	19	18	1		
⊠	3002	0.3ft	SILTY SAND(SM)	NP	NP	NP		
▲	3004	9.0ft	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.62	41.62
★	3006	14.0ft	SILTY SAND(SM)	NP	NP	NP		
⊙	3009	4.0ft	SILTY SAND(SM)	NP	NP	NP		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3000	4.0ft	12.5	0.308	0.103		8.0	75.3	16.8	
⊠	3002	0.3ft	12.5	0.162	0.089		4.0	75.5	20.5	
▲	3004	9.0ft	19	3.047	0.601		29.1	60.6	10.2	
★	3006	14.0ft	2	0.112	0.081		0.0	76.9	23.1	
⊙	3009	4.0ft	9.5	0.132	0.082		1.4	74.7	24.0	

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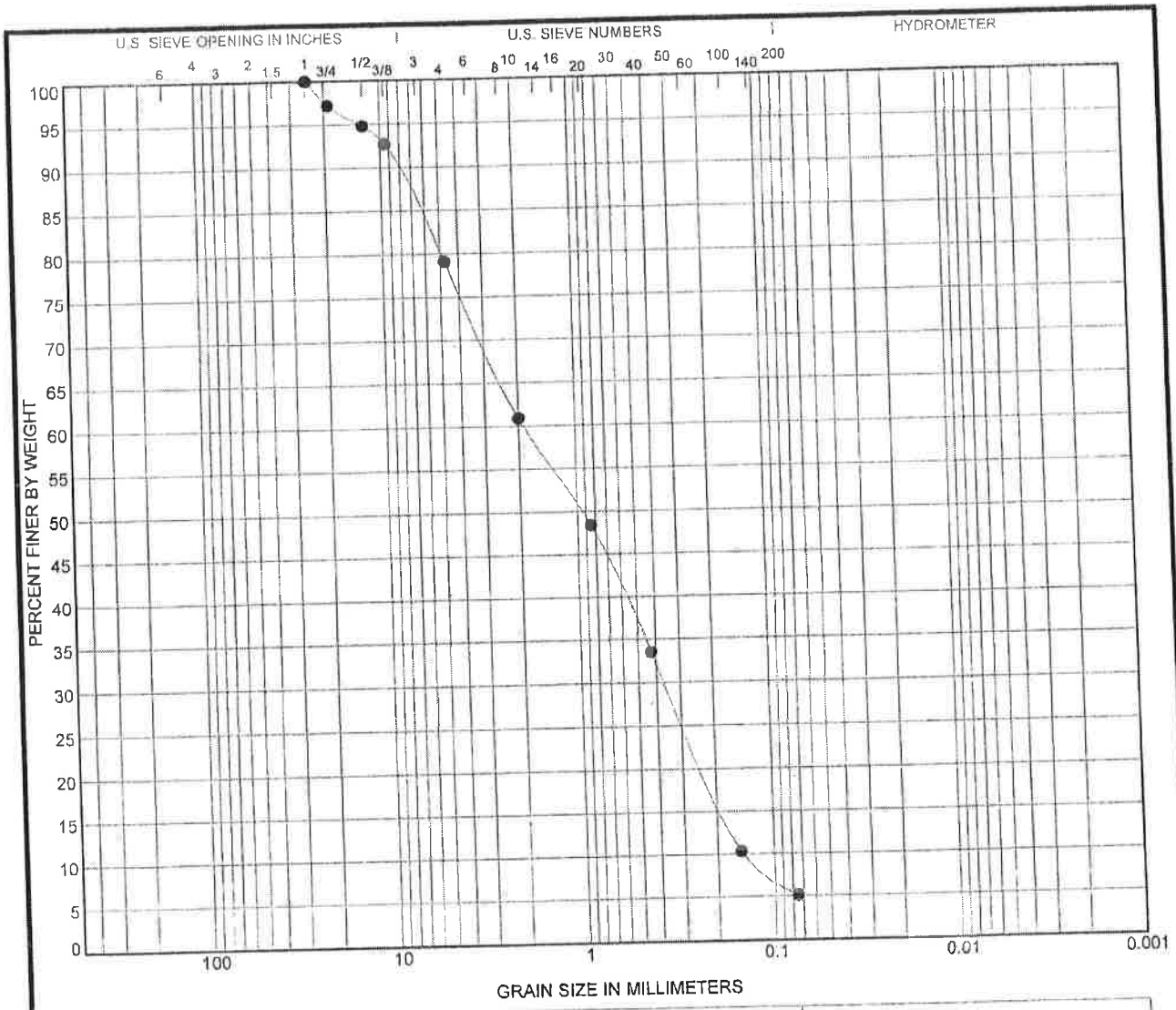
GRAIN SIZE DISTRIBUTION

Project: B & L Site
Site: Campstool Road Cheyenne, Wyoming
Job #: 24055066
Date: 10-12-05

Exhibit ML-7



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 3010	4.0ft	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.49	13.12

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3010	4.0ft	25	1.879	0.363	0.143	20.9	73.9	5.2	

GRAIN SIZE 24055066.GPJ TERRACON.GDT 10/12/05

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GRAIN SIZE DISTRIBUTION

Project: B & I. Site
Site: Campstool Road Cheyenne, Wyoming
Job #: 24055066
Date: 10-12-05

APPENDIX C

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube - 2" O.D., unless otherwise noted	PA:	Power Auger
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB:	Wash Boring or Mud Rotary

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value".

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	WS:	While Sampling
WCI:	Wet Cave in	WD:	While Drilling
DCI:	Dry Cave in	BCR:	Before Casing Removal
AB:	After Boring	ACR:	After Casing Removal

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	<2	Very Soft
500 – 1,000	2-3	Soft
1,001 – 2,000	4-6	Medium Stiff
2,001 – 4,000	7-12	Stiff
4,001 – 8,000	13-26	Very Stiff
8,000+	26+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	Relative Density
0 – 3	Very Loose
4 – 9	Loose
10 – 29	Medium Dense
30 – 49	Dense
50+	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1-10
Medium	11-30
High	>30

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UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification	
					Group Symbol	Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]		GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]		GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH		GM	Silty gravel[F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel[F, G, H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[E]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]		SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]		SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH		SM	Silty sand[G, H, I]
			Fines classify as CL or CH		SC	Clayey sand[G, H, I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K, L, M]
			PI < 4 or plots below "A" line[J]		ML	Silt[K, L, M]
		organic	Liquid limit — oven dried / Liquid limit — not dried	< 0.75	OL	Organic clay[K, L, M, N] / Organic silt[K, L, M, O]
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line		CH	Fat clay[K, L, M]
			PI plots below "A" line		MH	Elastic silt[K, L, M]
		organic	Liquid limit — oven dried / Liquid limit — not dried	< 0.75	OH	Organic clay[K, L, M, P] / Organic silt[K, L, M, Q]
Highly organic soils		Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

[L] If soil contains ≥ 30% plus. No. 200 predominantly sand, add "sandy" to group name.

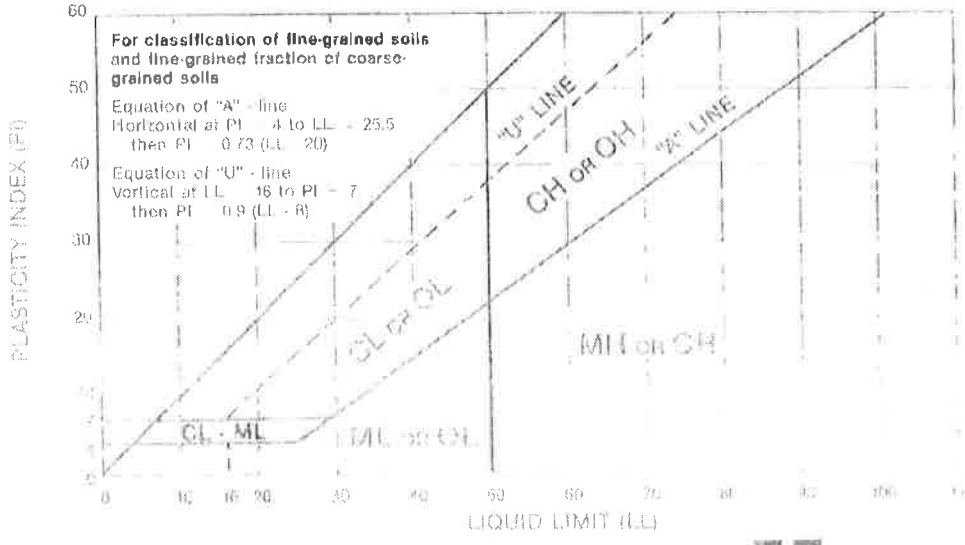
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



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